

POPULATION DENSITIES OF THE BLACKNAPED HARE *LEPUS NIGRICOLLIS NIGRICOLLIS* AT ROLLAPADU WILDLIFE SANCTUARY, KURNOOL DISTRICT, ANDHRA PRADESH¹

(With one text-figure)

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This paper is part of a study carried out on the Indian fox *Vulpes bengalensis* at Rollapadu Wildlife Sanctuary, Kurnool dist., Andhra Pradesh, between July 1994 and April 1995. It describes the census method (actually devised for the fox) used for estimating population densities of the blacknaped hare *Lepus nigricollis nigricollis*. A comparative census was conducted in grazed grassland and ungrazed grassland for the species. The results of the censuses are discussed.

INTRODUCTION

During censuses of the Indian Fox *Vulpes bengalensis* at Rollapadu Wildlife Sanctuary (RWS), Kurnool dist., Andhra Pradesh, we encountered the blacknaped hare *Lepus nigricollis nigricollis* quite regularly during the samplings. We realised that the census technique used for the fox was also suitable in detecting and estimating population densities of the hare. We suggest the use of this census technique for estimating the population densities of hares, since it can be done by an individual and does not need any equipment. Other methods, such as trapping or drive counts, are stressful for the species, and involve more personnel, effort and equipment. In this note, we describe the census method used, and discuss the findings of the study.

STUDY AREA

Rollapadu is 18 km southeast of Nandikotkur (15°58'N and 78°18'E), Kurnool dist., Andhra Pradesh. It lies in the plains between the Nallamalai and Yerramalai hills, at an altitude of about 200 m. The terrain is gently undulating, with predominantly poor red soil. The region is semi-arid with an average annual

rainfall of 668 mm, received from both the Southwest and Northeast monsoons. Summer (March to May) peaks at 42°C and winter (November to February) is mild (17°C).

The Sanctuary, covering an area of 6.14 km², consists of three grazing and disturbance free grassland enclosures, set up in 1982 to improve the habitat of the great Indian bustard *Ardeotis nigriceps*. These enclosures are surrounded by grazing land and crop fields. The grazed grassland is characterised by short grass (<30cm) with poor ground cover, dominated by *Chrysopogon fulvus*, *Heteropogon contortus* and *Melanocentris jacquemontii*. The ungrazed grassland (enclosures) has taller grasses (c. 50 cm.) with good ground cover, dominated by *Heteropogon contortus*, *Chrysopogon fulvus* and *Eremopogon foveolatus*. *Sehima nervosum* (>100 cm), the climax grassland species of gravelly soils of these areas (Dabadghao and Shankarnarayan 1973) has formed pure stands in patches in some areas of the enclosures. The scrubland was dominated by *Carissa spinarum*, *Cassia auriculata*, *C. fistula*, *Phoenix sylvestris*, and *Zizyphus mauritiana*.

The other major fauna of the Sanctuary are lesser florican *Sypheotides indica*, harriers (mostly *Circus pygargus* and *C. macrourus*), blackbuck *Antelope cervicapra*, wolf *Canis lupus*, jackal *Canis aureus* and common Indian monitor

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Varanus bengalensis. For more details on the Sanctuary, see Manakadan and Rahmani (1989, 1993 & 1997).

Methodology

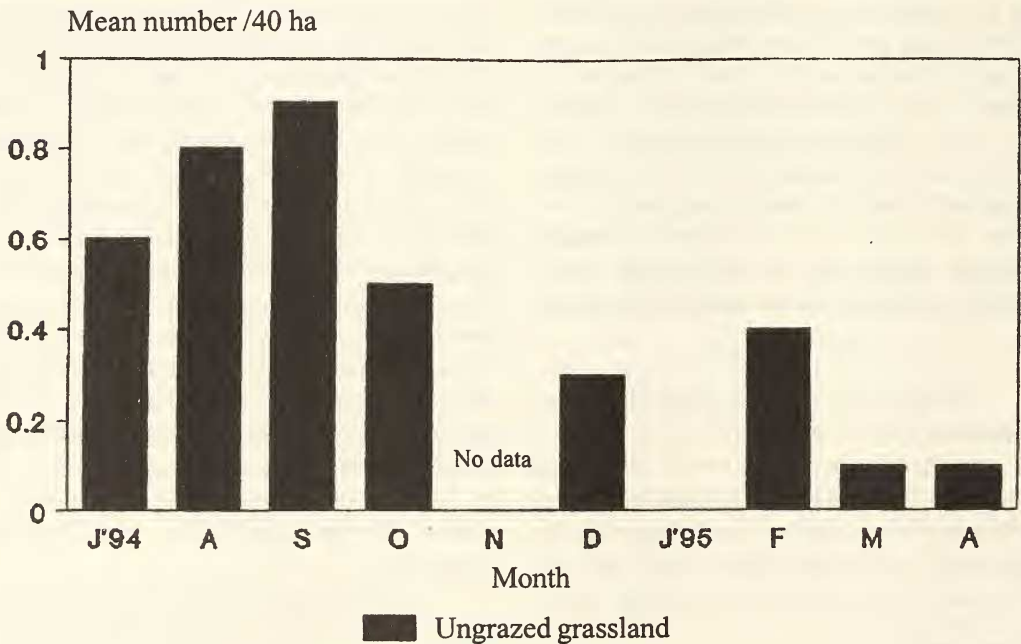
Four sites were selected in each of the two habitat types (grazed grassland and ungrazed grassland). The area was thoroughly covered on foot at a constant steady pace, walking in an irregular and generally zigzag manner. Some light noise, such as humming, dragging of feet or tapping the bushes with a stick, was made to flush out hares. On flushing a hare, the direction it ran and the place it stopped was noted to avoid duplication of counts. The micro-habitats (grass/shrub species and their height) in which the animals were encountered were recorded. A unit time (animals/hr) adopted as the basis of the censuses initially, was later modified, as larger areas could be covered in the grazed than ungrazed grassland in the time period, due to

the greater visibility in the former. Hence, approximately the same area (ca. 40 ha) was covered in the two habitat types during the one hour searches.

Census was done in the evenings once a fortnight from July 1994 to April 1995. Except for one site in the grazing land, which was predominantly open short scrubland, all the other site samples were grassland (grazed or ungrazed). Censuses conducted in tall grass areas (> 100 cm) and dense scrubland were discontinued, as it was apparent that the technique was unsuitable for such habitat types (hares could hide or run off undetected).

RESULTS

Considering the mean values of the four sites for each habitat type, the hare was recorded for all the months in the ungrazed grassland, and only once in the grazed grassland (Fig.1) during



Note: The hare was recorded only once in the grazed grassland

Fig. 1: Density of the blacknaped hare at Rollapadu Wildlife Sanctuary

TABLE I
CHARACTERISTICS OF HARE SIGHTING SITES

Vegetation Type	No. of sightings	Remarks
Short grass (<30 cm)	11	Nine hares under cover of a bush or tall grass tussock.
Tall grass (>30 cm - ca. 50 cm)	15	One hare under cover of a bush.
Medium grass (tall + short)	1	-
Total Sightings	27	-

the wet season (July - October 1995). Data was not collected from November to the first fortnight of December. For the rest of the study period (second fortnight of December till April 1995 - dry season), the hare was not recorded in the grazed grassland, but was occasionally flushed in the ungrazed grassland. Densities of the hare were lower in the dry season than in the wet season. There were no sightings of the hare in the scrubland habitat sampled.

Of the total of 27 sightings (Table 1) in both the habitat types together, the maximum sightings were in tall grass areas (> 30cm to ca. 50 cm). Of the eleven sightings in short grass habitat (< 30 cm), in nine cases, the hares were detected under the cover of a bush or tall grass clump, pointing to the necessity of cover in short grass areas.

DISCUSSION

The hare is nocturnal, but not exclusively so (Prater 1980). Hence, most of the sites where the hare was recorded were likely to be 'forms' (regular sleeping spots where the grass is arranged into a hollow) or near such sleeping quarters. Nevertheless, the repeated flushing of hares from the same area could also indicate that these animals held territories. This implies that areas surrounding such 'forms' were their foraging areas.

The population of the hare was low in the grazed grassland, while it was fairly high in the

ungrazed grassland in the enclosures. Greater grass biomass, cover from predators, and the absence of human related disturbances, provided better habitat and survival chances for the hare in the enclosures. In the grazing land, fodder was scarce, grass cover minimal, and disturbance from humans heavy, except during summer. Surreptitious hunting of hares also occurred in the grazing lands. In the grazing lands, the hare takes shelter under thorny bushes or in crop fields (where villagers trap them during the harvest). Judging by the lower densities during the hot season, there seems to be some dispersal or wandering of the hare during the hot season. Prater (1980) described greater movement of hares during the hot weather, when the grass is scarce.

The studies show that the hare is largely a grassland species, and has a preference for tall (ca. 50 cm) grasslands. Short grass areas, even within the protected enclosures, were not preferred, at least for 'forms'. Almost always, those recorded in short grass stands (*Heteropogon contortus*, *Chrysopogon fulvus*) in the enclosure were found under a bush or an isolated patch of tall grass (*Eremopogon foveolatus*, *Sehima nervosum* or *Cymbopogon caesius*). Very few sightings during these or other studies were obtained from scrub-dominated areas of either the enclosures or grazing lands. Therefore, the spread of scrub, as seen in some areas of the enclosures, could be detrimental to this species.

Our studies show that the census technique devised by us could be used for estimating the populations of the hare (and other similar reclusive species) in grassland and scrubland habitats of up to ca. 50 cm.

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